Dutchman Peak Botanical Area Plan

Prepared by Carol Spinos for
The U.S.D.A. Forest Service, Rogue River - Siskiyou National Forest
Applegate Ranger District
6941 Upper Applegate Road
Jacksonville, OR 97530

Dutchman Peak Botanical Area Plan

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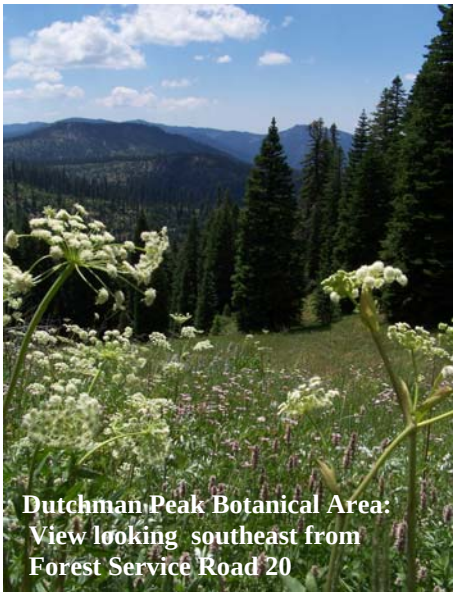
Dutchman Peak Botanical Area Plan

January 2006

I. Introduction



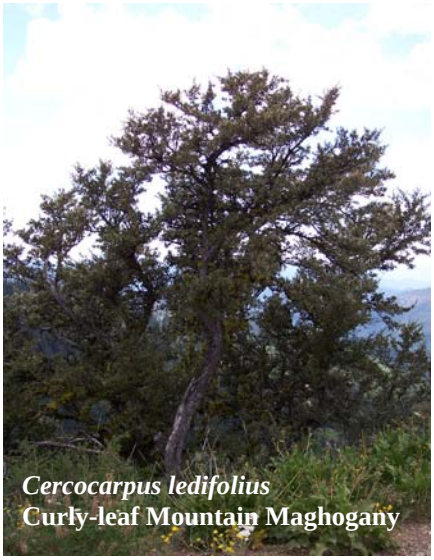
Dutchman Peak Botanical Area: View looking southeast from Forest Service Road 20

Dutchman Peak has long been a destination point for botanists visiting the area. The sub-alpine flora and spectacular wildflower displays are a major draw after the snow recedes enough to permit access. The diversity of this flora is considered to be unequaled in comparison to other high peaks in the eastern Siskiyou Mountains.

The 2005 Dutchman Peak Botanical Area Plan is designed to present sufficient, analytical information as a catalyst to inform upcoming natural resource programs of work and field-related decisions on National Forest System lands. The overall goal of management actions is to change the trend of current conditions currently threatening sensitive and rare floral resources, particularly those associated with safeguarding botanical biodiversity from the risk of human disturbance.

The 2005 Dutchman Peak Botanical Area Plan includes a compilation of existing information, identification of key issues and findings, as well as recommendations and opportunities available to Rogue River - Siskiyou National Forest decision-makers for managing unique floral diversity.

Elements of several floristic provinces are present; many of which are sub-alpine low cushion representative of Sierra Nevada and High Cascades floras. Curly-leaf Mountain Mahogany and low sagebrush indicate Great Basin elements. In addition, the Upper Glade basin contains large mountain meadows and wetlands supporting *Mimulus* species, *Wiggin's* lilies, giant larkspur, monk's hood and checkermallows, to name a few.



Cercocarpus ledifolius
Curly-leaf Mountain Maghogany

The findings and results reported in the following are based on a combination of literature review, field reconnaissance, expert opinion, and the most current resource information available. The management strategy recommendations and opportunities presented were developed within the framework of pertinent legal mandates, availability of existing infrastructures, and environmental concerns expressed by Forest Service resource specialists.

This 2005 Area Plan is not a decision document. Future ground-based decisions require public review under the National Environmental Policy Act (NEPA) for Federally-managed lands. Subsequent phases will likely entail environmental analyses conducted under NEPA for proposed actions that emerge, including monitoring activities.

This Plan is prepared under the 1990 Rogue River National Forest standard and guidelines, as amended in 1994, for the Botanical Area land management allocation (8. Develop a Special Area plan for each area). Botanical Area plans are intended to be long-term documents that establish and articulate a management philosophy and framework for decision-making and problem solving, typically over a 10-15 year period.

A. Landscape Location

The Dutchman Peak Botanical Area is situated on the highest slopes of the "Siskiyou Crest" in southern Oregon. It lies within the uppermost reaches of Yale Creek, Glade Creek and Silver Fork in the Little Applegate watershed. Elevations range from 5,700 to 7,418 feet. The Botanical Area boundary includes an area of approximately 864 acres, composed of high meadows and slopes of the eastern Siskiyou Mountains (USDA 1995).

Dutchman Peak Botanical Area: View looking south from Forest Service Road 20

II. Management Direction

The National Forest Management Act and US Forest Service Manual [FSM] require the Agency to maintain populations of all existing native plant and animal species at or above the minimum viable population level.

Eriogonum umbellatum
Sulfur Buckwheat

Botanical Areas are established on public lands administered by the USDA Forest Service, authorized under 36 Code of Federal Regulations [CFR] 294.1; classified as Special Recreation Designations (Forest Service Manual [FSM] 2370). A Botanical Area is defined as, "a unit of land that contains plant specimens, plant groups or plant communities that are significant because of their form, occurrence, habitat, location, life history, arrangement, ecology, rarity or other features (FSM 2372.05).

Botanical Areas are an important component of the Forest's rare and sensitive species management program. Rare species are defined as "Those plant species recognized by botanists as being uncommon" (Wayne Rolle 2005: pc). Sensitive species are defined as "Those plant species identified by a Regional Forester for which population viability is a concern, as evidenced by significant current or predicted downward trends in population numbers or density, and/or significant current or predicted downward trends in habitat capability that would reduce a species' existing distribution (FSM 2670.5.19)".

The establishment of a Botanical Area requires analysis and a decision under the National Environmental Policy Act. An evaluation of candidate botanical area values was conducted under the 1990, Rogue River National Forest Land and Resource Management Plan (LRMP), to provide a comparison of values between candidate areas. Six criteria were applied including: "number of species, unique species known to be present, how much overall botanical diversity is present, how well known and important is the area to professional and amateur botanists, does the area contains species or plant communities that are not well represented elsewhere, and how the designation as a Botanical Area affect the utilization of other forest resources (primarily timber and range) that may be present in a candidate area. Dutchman Peak had the highest rating out of all candidate areas" (FEIS Appendix, page F-5 & F-6).

Monardella odoratissima
Coyote Mint

The Record of Decision associated with the LRMP was signed on July 20, 1990, establishing 12 Botanical Areas containing a total of 5,920 acres; all of which are located in the Siskiyou Mountains. These Botanical Areas are considered special areas due to the concentrations of rare species, exceptionally rich and diverse floras and plant communities that are seldom found in an undisturbed condition. Dutchman Peak is considered the premier Botanical Area on the Rogue River National Forest.

Under the 1990 Rogue River LRMP, the objective of Botanical Areas is to, "Protect and enhance exceptional botanical values. Encourage compatible scientific, educational and recreational use" (USDA 1990). They also provide a cornerstone for maintaining biological diversity (FEIS, Appendices F-1). When conflicts exist between botanical area management and other resources, the conflict will be resolved in favor of the botanical resource, subject to rights under law and regulation (USDA 1990). Under the 1990 Rogue River LRMP, specific standards and guidelines are provided to allow attainment of the management objective. Applicable management direction is summarized below.

Recreation

Within the Botanical Area, dispersed recreation activities such as hunting, fishing and hiking are permitted. However, trails and dispersed occupancy sites will be managed in a manner not in conflict with special area resource values. Gathering of plants or plant parts will not be allowed except by permit for scientific or educational purposes. Motorized vehicles will be allowed only on roads except in emergency situations. The exception is that snowmobile use may be allowed when snow depth is sufficient.

Dutchman Peak Lookout

Wildlife, Fish and Plants

Manipulation of wildlife and fish habitat will be allowed as long as it maintains a natural appearance and does not conflict with the purpose or objective of the area. Endangered, threatened and sensitive species (and species proposed for Federal listing by US Fish and Wildlife Service will be identified and managed in cooperation with the Oregon Department of Fish and Wildlife, Oregon Department of Agriculture, Oregon Natural Heritage Database, and California Department of Fish and Game.

Legal and biological requirements for the conservation of listed and proposed endangered, threatened and sensitive plant and animal species will be met. Habitat for existing federally-listed species shall be managed to achieve objectives of recovery plans.

Eriogonum umbellatum
Sulfur Buckwheat

Range

Livestock grazing will be controlled in order to benefit or maintain the botanical resource. This control can range from limited or no livestock grazing to seasonal adjustments to benefit the target species. Forage utilization standards will be based on this direction. Range improvements and vegetative manipulation will not be permitted unless they will benefit the botanical resource. No exotic species will be seeded or placed in botanical areas.

Provide fences and stock control devices when necessary to protect floral resources.

Timber
There will not be any scheduled volume from these areas. Timber harvest can only take place if it benefits the botanical resources. The exception will be that timber harvest will be allowed to prevent the spread of insects and disease to areas managed for other purposes or to meet the management area objectives.

Water
Allow for watershed restoration projects that are compatible with floral management objectives.

Minerals
Prohibit aggregate source development and expansion of existing aggregate sources. Mineral withdrawal will be considered on an area-by-area basis. Rehabilitate aggregate sources when they are closed.

Human and Community Development
Conduct compliance reviews as required by Title VI of the Civil Rights Act of 1964, and established Forest Service standards. Identify opportunities for the Forest to coordinate resource activities compatible with interests of surrounding Indian tribes. Identify opportunities to coordinate resource activities with the interest of adjacent communities.

Lands
Revise all special use permits to be consistent with the direction in this management strategy when renewed. Discourage new rights-of-ways.

Soils
Alternative management practices will be developed or mitigating measures planned and implemented when activities are likely to result in detrimental soil displacement, compaction, mass wasting or erosion. Design management activities to retain effective ground cover. The mineral soil exposure should not exceed forty percent on soils classified as very slight, slight, low or moderate erosion hazard soils, thirty percent on high or severe erosion hazard soils, and fifteen percent exposure on very high or very severe erosion hazard soils.

Facilities
New road locations proposed in botanical areas will be evaluated for their impact on botanical and recreational values. Alternative locations outside botanical areas will be sought and chosen when feasible.

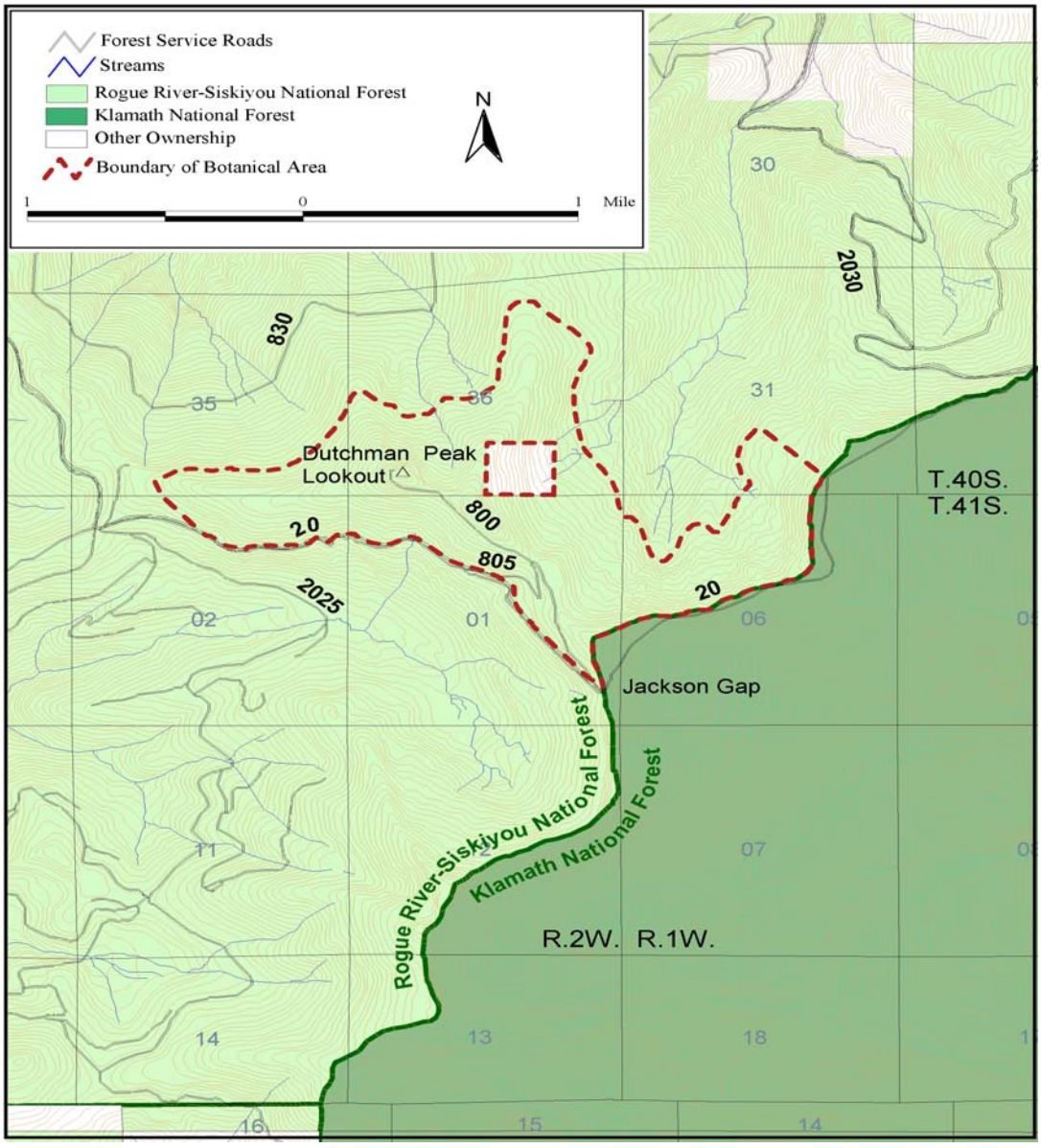
Protection
Plan pest control alternatives to be biological selective, cost beneficial and that have no irreversible adverse effect on the environment. Provide a low level of prevention activities limited primarily to public contact through patrol and fire prevention signing at campgrounds, rest areas, main access road junctions and information centers (USDA 1990).

III. Botanical Area Characterization

This section presents a synopsis of the physical, biological, and human social current conditions within and around the Dutchman Peak Botanical Area. The description of various resources are discussed at several scales, as environmental components such as climate and geology tend to be regional, hydrology is suited to sub-watersheds and watersheds, with human social influences most relevant at the Area, or site level. Conditions are organized and discussed by pertinent resource or combination of inter-connected resources.

A. Access

The Dutchman Peak Botanical Area is accessed from Forest Service Road 20, which generally runs in an east – west direction along the Siskiyou Crest. Additionally, Dutchman Peak Lookout can be accessed by either Forest Service Road 800 or 805.



B. Physical Environment

Parent Geology

This landscape lies along the eastern margin of the Klamath Mountains physiographic province, representing some of the most geologically complex and oldest terrain in North America. The Klamath Mountains province extends into northern California and is subdivided into individual belts of different lithology that have been accreted or sutured to the southwest Oregon and northwest California coastlines. These belts represent progressively younger (from east to west) slices of the earth's crust that were carried along the eastern margin of the Pacific plate and then collided with the western edge of the North American plate.

Dutchman Peak Botanical Area:
View looking south from Forest Service Road 20

This landscape is located within the Western Paleozoic and Triassic Belt, with rocks ranging in age from roughly 250 to 130 million years old. The southern ¼ of the Little Applegate watershed is within the Rattlesnake Creek subterrane of the Western Paleozoic and Triassic Belt. This assemblage of rocks originated in the oceanic crust and upper mantle region, nearly three miles below the ancient seafloor. The majority of this landscape is underlain by amphibolite, intermixed with serpentine and granitic bedrock of the Mount Ashland Pluton (USDA 1995).

Climate

During the Pleistocene Epoch, or "Ice Age" (beginning about two-million years ago), there were a number of major glacial periods; the latest of these, (often referred to as the "Wisconsin") included several shorter sub-periods of glacial advance and retreat. During the closing millennia of the Ice Age, elevation of the permanent snowline along the Siskyou Crest between Dutchman Peak and Mount Ashland may have been as low as 6,500 feet. Possibly as late as 10,000 – 9,000 years ago, near the end of the Ice Age, the last remaining glaciers that carved the landscape of the Siskiyou Crest near Dutchman Peak disappeared.

Climatic conditions during the Pleistocene/Holocene transition (applies to the relatively recent period of the past 10,000 years) may have included a severe 300-year-long drought beginning around 11,200 years before present (B.P.) (C. Vance Haynes, as cited by Ames 1993:B5). Consequentially, existing vegetative communities and fauna of southwestern Oregon would have experienced serious stress and undergone major changes in distribution during the early Holocene. Evidence from fossil pollen studies, macrofossils, and other sources in the Pacific Northwest indicate that the climate of the Holocene in the Far West region underwent three periods of change (Heusser 1983, Gayson 1993:193 – 229; Connolly et al. 1994:16 – 17; West 1989 in: Basgall and Hildebrandt 1989:36 – 55; Barnosky 1985:263 – 271, as cited by LaLande 1995:3).

Immediately following the brief but intense Pleistocene/Holocene transitional drought, the Holocene climate from about 10,000 to 8,000 – 7,500 years ago was apparently significantly cooler and more moist than at present. However, the early Holocene was not sufficiently cold and wet so as to initiate another round of glacial advance. The next Holocene climatic period, which lasted from about 8,000 - 7,500 to 4,500 years ago, was a period of relatively hot, dry climate. This mid-Holocene "drought" was a period of widely varying temperature and precipitation cycles during which the overall average was hotter and drier than present. The third and latest climatic period of the Holocene (the last 4,500 years) returned generally cooler temperatures and increasing moisture, gradually leading to the climatic regime of the present.

Presently, the Siskiyou Crest receives an around 38 to 50 inches of precipitation per year, with a mean annual temperatures ranging from 41 and 47 degrees F. Most of the precipitation comes as snow in the winter. Snow accumulations of up to 15 feet are common, generally lasting into early June.

Summer precipitation can come in torrential downpours from storm cells. Lightning strikes are also associated with these storms cells. Wet winter and spring months are followed by a prolonged season of very little precipitation. Around seven percent of the annual precipitation normally occurs from July through September. While the annual precipitation can vary widely from year to year, the decadal average indicates wet and drought cycles with declining precipitation trends during the past four decades (LaLande 1995).

Geomorphology

The landscape as seen today is in the mature stage of erosion. Geologic structures include faults, folds, domes and igneous intrusions. Although observable faults are not evident, the composition of granite rock lends itself to fracturing and weathering processes. Ground water tends to accumulate in joints, being released into down-slope stream systems throughout the year as springs, seeps or groundwater. The presence of springs and seeps at comparable elevations indicates that these joints are connective and extensive across the landscape (Jones 1995).

Bedrock in the Glaciated Headwaters region produces thin rocky soils where erosion strips away the weathering products as they are formed. Granitic rocks are noted for their high strength when fresh. However, when exposed to weathering, the coarse minerals are readily separated from each other by a process known as decomposition. Thus, relatively fresh crystals of feldspar and quartz form sandy decomposed granitic soils that are easily transported off site through surface erosion or debris slides. This rapid erosion processes is very active in this landscape, maintaining fresh granite bedrock near the surface rather than producing a thick soil mantle. It is thought that precipitation rates are low enough so that erosion rates are less and infiltrating groundwater has sufficient time to alter feldspar minerals to clay.

Fault zones associated with fractured, sheared and pulverized rock resulting from the movement of geologic formations have created weak zones, which are more readily impacted by erosion and mass wasting processes. These faults have acted to control the alignment of Glade Creek and its headwaters, situated in the eastern portion of the Dutchman Peak Botanical Area.

View looking south into Silver Fork Basin

Glacial events during the Pleistocene are responsible for the cirques and associated rock outcrops/headwall, U-shaped valleys and moraine deposits found in the upper elevations.

Moving water is the primary erosion agent causing forms of sheet, rill, gully and channel erosion. Summer thunderstorms are known to activate particularly erosive processes in cohesionless soils.

The combined effects of wind and solar radiation, which tend to dry the uppermost surface of the soil has lead to the raveling of fine soil particles. Additionally, frost heave of the upper soil surface has resulted in soil and rock fragments to move upwards perpendicular to the slope surface during freezing and then back downwards upon melting. This process is known to lift and redeposit rock of considerable size resulting in the continual down-slope movement of rock. Debris slides/flows have been an active agent of mass wasting in this landscape for millions of years. This Glaciated Headwater landscape has a moderate to high potential for debris slides due to the predominance of highly angular rock in the soil mantle (Steinfield and Jones 1995).

Soils

Soils typically have very gravelly and cobbly loam textures. Soils on the upper slopes tend to be shallow with an occasional rock outcrop. Duff and litter thickness ranges from 2 to 4 inches thick. In the surface 6 to 10 inches of extremely gravelly soils, duff is often found mixed between gravel fragments. On these sites, the duff takes the place of soil in regard to storing moisture and nutrients for plants to utilize. Soil samples collected in undisturbed stands below Dutchman Peak by the US Forest Service indicate most sites contained moderate levels of nitrogen but were very low in phosphorus.

Aerial photographs taken in 1939 show active rills and gullies in a many high elevation meadows surrounding the Botanical Area, as well as a few areas within the Botanical Area. This observed feature is the “red-fir barrens”. This refers to soils that are completely devoid of vegetation. It is speculated these soils originated through overgrazing and were then maintained thereafter by pocket gophers (Laurent, Graham and Rice 1994). These soils are very infertile (low in nitrogen, calcium and magnesium), draughty and subject to environmental extremes such as heavy frost and high winds (USDA1994; McDonald Basin Soil Monitoring Report – working papers).

The ability of a soil to recover to its original porosity or soil structure is its resiliency. Though there is limited long term research in this area, several fairly extensive retrospective studies conducted in the Northwest indicate that recovery of compacted soils is at least in the order of decades if not longer. Evaluating 25 year old tractor skidtrails in Idaho, Froelich (1983) found that the top several inches of granitic soils recovered to their original bulk densities in 20 years. The recovery rates at the 6-12 inch soil layer were even greater with granitic soils estimated to take 45 years. Recovery rates and processes at high elevations are not clearly understood.

Hydrologic Features

This landscape lies within the Glade Creek, Yale Creek and Silver Fork sub-watersheds. Several Class III streams, which are streams fed by year-round springs and seeps associated with wet meadows and alder glades, are present in the southern portion of the Dutchman Peak Botanical Area. According to data collected by the Oregon Department of Fish and Wildlife in 1994 (channel typing data categorized per the Rosgen classification system), streams in the Botanical Area are steep gradient (4 - 10 percent), well entrenched, cascading, step/pool streams having low sinuosity (1.0 – 1.2) with wide/depth ratio less than 12. The dissolved oxygen percent saturation level tends to be high, ranging from 82 to 100 percent, reflective of the generally high gradient nature of the stream channels. Because the soils are higher in rock content and coarser textured, the streams tend to carry less sediment than streams in adjacent landscapes. Originating in this region, this landscape contributes a high volume of cool water (<61 degrees F) to the Little Applegate River downslope (USDA 1995).

Fire

Fire has played a major role in the development and maintenance of plant communities. Since anthropogenic fire has been a major disturbance agent for several thousand years, its role in the development and maintenance of pre-settlement plant communities cannot be segregated from that of fire from natural causes. Dense smoke was a near-annual affliction throughout the 1860s – 1900s, but smoke-filled summer skies were especially newsworthy from 1869 through 1874, possibly indicating a dry cycle. In September 1874, the Democratic Times's editor (9/4/1874) remarked that it seemed "as though no year shall pass…the country [is] deluged with smoke…the fire [this year] is as bad as ever and the sun can hardly be seen for the smoke." The summers of 1883 and 1885 also saw widespread fires in the foothills of the eastern Siskiyous (Ashland Tidings 3/7/1883, 8/14/1185). The Ashland Tidings editor remarked on September 27, 1889 that "fires are still burning in almost every direction in the high mountains." A "fire proposition" on Glade Creek grew to newsworthy portions in September (Ashland Tidings 9/8/1910). Descriptions of the 1910 fires in the eastern Siskiyou indicate that they were, for the most part, light burns that consumed mainly grass, brush, and small trees.

As the US Forest Service successfully implemented an aggressive fire-detection and fire-suppression regime during and after World War One, the number and size of fires in the eastern Siskiyous decreased. Forest survey data collected in 1947 indicate long term differences in the structure and species composition of mixed conifer plant communities on mid and upper elevation northerly exposures. The encroachment of less fire resistant and more shade tolerant species was significant. In the absence of fire, high elevation meadow plant communities have been reduced as conifers encroached along the edges.

Quartz Fire

Drought conditions in Southern Oregon made for extreme fire danger as August of 2001 began. On August 9th, 2001, a dry thunderstorm entered the Applegate Valley of Southern Oregon and lightning strikes ignited seven fires. All were contained, except for one. That fire, initiating on Bureau of Land Management (BLM) managed lands just south of the Botanical Area, was to become known as the Quartz Fire. The initial attack on the fire was performed by Oregon Department of Forestry, as they have firefighting responsibility on BLM, private, and State of Oregon managed lands. The fire grew to 35 acres overnight and quickly jumped to 2,000 acres within 24 hours. By day two, 4,000 acres had experienced fire and a full scale "project" fire was in effect (Grigsby 2005: p.c.). Although the Quartz Fire did not directly affect floral resources within the Dutchman Peak Botanical Area, a tractor-created suppression break was constructed within the Area for approximately 0.75 miles along a predominant ridge in the southern portion (Mumblo 2005: p.c.).

C. Biological Environment

Flora

Tsuga mertensiana
Mountain Hemlock

Vegetative communities changed and adapted to new climate regimes over time. Mixed-conifer stands (which probably contained many of the same species as present mixed-conifer stands in the Siskiyous) may have initially developed at lower to mid elevations and then "migrated" upslope during succeeding centuries of the early Holocene. Some conifers present during the Pleistocene may have (like the megafauna) disappeared entirely, even as other resident Pleistocene (and now "endemic" plant species) survived in southwestern Oregon and no place else.

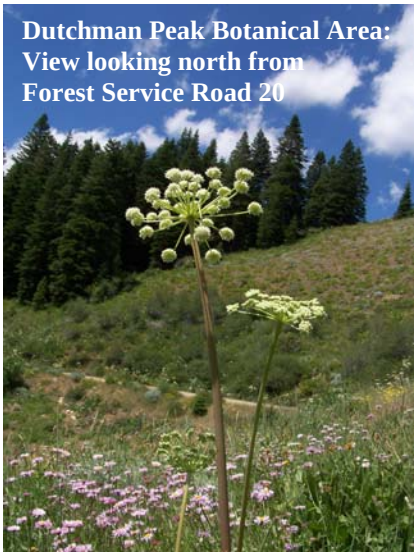
Although creating desert conditions elsewhere (the northern Great Basin for example), the mid-Holocene dry spell may have actually increased the floral, fauna and human carry capacity of the eastern Siskiyous. Some of the higher elevation "openings" of southwestern Oregon are relict communities from the mid-Holocene "drought" period; bulb plants may have become more common during the Xerothermic than they were before (LaLande 1995).

Dutchman Peak Botanical Area: View looking north from Forest Service Road 20

The earliest General Land Office surveys of the higher portions of the Little Applegate watershed occurred in 1883. Near the summit of the Siskiyou Crest, in the headwaters of Yale and Glade Creeks (elev. approx. 5,500' – 6,500'), timber was inferior and not abundant", but there was "good grass and water" (Moore 1883 [T40S/R2W). The General Land Office survey notes portray the highest elevations as a more grass-dominated mosaic that supported true-fir—most of it, while perhaps not "young", smaller in size than the mature timber on the mid-slopes. The "alpine type" of forest, contained "little if any merchantable timber" and "scant reproduction" (Harvey 1909:n.p.).

Arctostaphylos nevadensis Pinemat Manzanita

The next body of broad-scale vegetation description dates from the mid-1930s through the mid-1940s. It includes panoramic photographs, and the 1947 Jackson County Forest-Type Map prepared as part of the U.S Forest Service "Forest Survey of the Douglas-Fir Region. These sources date pre-fire suppression policies. The 360-degree panoramic photograph taken in 1936 from Cinnabar Peak Lookout (on the west edge of the Little Applegate watershed, elev. ~3,900') presents distant views of the lower Little Applegate's south-aspect foothills and of the Siskiyou Crest area between Wagner Butte and Dutchman Peak (Rogue River N.F. 8/10/1936). The area displayed extensive open grasslands and brushfields in 1936; the proportions between the two were roughly one-third or more grass and less than two-thirds brush. In the mid-1990s, the 1936 grassy areas remain open but are noticeably smaller in size. The amount of brush has grown to nearly four-fifths of the non-forested total; additionally, what were sparsely covered brushy areas in the 1930s have become dense brushfields sixty years later.



Dutchman Peak Botanical Area: View looking north from Forest Service Road 20

Lichen diversity is high on exposed rocks. The most spectacular assemblages are found on the ridge tops from McDonald Peak to Dutchman's Peak, where the color of the rocky substrate is often masked by dense lichen cover.

The Area supports a diverse array of habitats in which mosses, liverworts, and lichens are predominant. Preliminary results from a partially completed high elevation inventory indicate as many as 35 species have been recorded from a single site of only a few square meters along a stream on the upper slopes of Dutchman Peak. Diversity is high on shaded rock outcrops, typically wet year-round, and seems to increase with elevation. Today, the high elevation northern aspects are dominated by high temperate and sub-alpine forests. On ridges and wet areas, grasses, forbs and wetland species occur (USDA 1995).

Rare and sensitive species include: *Castilleja schizotricha, Lewisia leana, Haplopappus whitneyi ssp. discoidea, Eriogonum diclinum, Perideridia howellii, Polystichum lemmonii, Sausurrea americana, Horkelia hendersonii.* The common (shrub) juniper is also present. A compilation of available plant lists can be found in Appendix A.

Fauna

Historically, terrestrial fauna of the eastern Siskiyous included herds of unglulates such as black-tail deer, Roosevelt elk, and along the highest sections of the Sisikyou Crest, small populations of bighorn sheep (Bailey 1936:65 and 69). Large predators included bobcat, cougar, red fox, coyote, gray wolf, black bear and grizzly bear. Various rodents, hares (jackrabbit), and mustelids were quite common. Numerous species of birds were native to or migrated through the area, including bald eagles, golden eagles, turkey vultures and California condors. Band-tailed pigeons were formerly much more common than at present.

Wolves were virtually extirpated from the eastern Siskiyous by 1890. A $2.50 bounty on coyotes during the 1890s put cash in the pockets of many rural residents (e.g., Ashland Tidings 2/19/1892). Despite once aggressive poison baiting, coyote managed to survive in the watershed. Cougars (called "panthers" by early settlers) were also aggressively hunted for bounty; by 1910 they were still "common" in the area, but over the next 25 years, a concerted campaign reduced their numbers throughout Oregon significantly (Bailey 1939:262). Elk have recently returned to the upper Little Applegate watershed, evidently migrating north from the south side of the Klamath River Canyon to the Siskyou Crest. The elk herd is estimated to contain 65 animals; largely confined to the Yale Creek area. There have been occasional reports of single or small bands of elk along the Siskiyou Crest. This herd has suffered some poaching losses in the last few years.

The state of Oregon Department of Fish and Wildlife, the US Fish and Wildlife Service, Bureau of Land Management and US Forest Service each keep their own separate lists of Special Status species. The Area supports roughly 48 terrestrial vertebrate species that have special status with either state or federal agencies. This estimate includes semi-aquatic species and birds. An agency specific list of Special Status species can be found in Appendix B (USDA 1995).

More than 65 percent of the flowering plants (angiosperms) are pollinated by animals, such as insects, birds, snails, and bats, but insects play a dominant role. The interrelationships between insects and flowering plants probably existed back in the Cretaceous period (more than 125 million years ago), and there is little doubt that each of these two groups has had a profound effect on the species evolution of the other. Baker (1968) and Crane et al. (1995) indicate that most primitive angiosperms were pollinated by insects (*entomophily*), especially beetles. Pollen was distributed as the beetle crawled about the flower eating petals and stamens. From these flowers have evolved the many complex forms we see today.

Some plants dependent on insects utilize promiscuous visitors and have few specializations to attract pollinators; others have specific visitors, and often reproductive isolation between related plant species is maintained by these insect-flower relationships.

Four major categories of plant adaptations that ensure or increase the efficiency of insect pollination include: (1) those that attract the insect to the flower so that pollen will be encountered, (2) those that have sticky pollen or pollen packets (*pollinia*) to adhere to the insect body, (3) those that "reward" the insect with either pollen or nectar, and (4) plant-density factors (Elzinga 2004).

Aquatic

The Dutchman Botanical Area is located within the Little Applegate watershed, classified as a Tier 1 Key Watershed per the 1994 Pacific Northwest Forest Plan. As such, this watershed serves as a refugia of high quality habitat intended to maintain and support the recovery of at-risk stocks of anadromous salmonids and resident fish species. Forty nine miles (14 percent) of the 362 miles of streams in the Little Applegate watershed provide habitat for fall Chinook and coho salmon, winter and summer-run steelhead, resident rainbow and cutthroat trout, reticulate sculpin, Pacific lamprey, Klamath smallscale sucker, and resident shiner (USDA 1995).

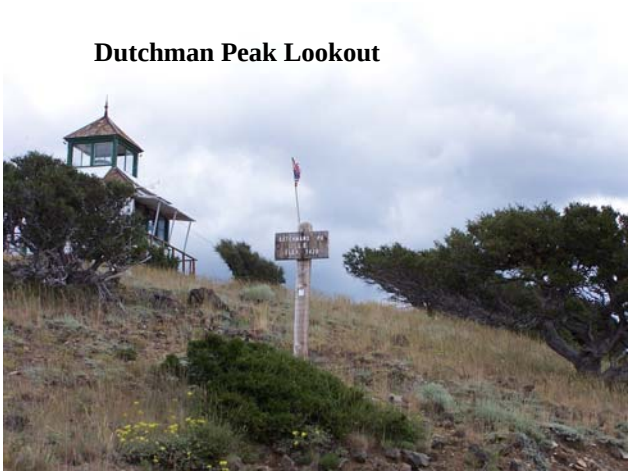
The tailed frog is considered a sensitive indicator of cold, well-oxygenated streams (Welsh et al.1993). Random sampling by the US Forest Service in 1994 located tadpoles in the upper Yale Creek, Glade Creek and Silver-Fork drainages. This is at the upper end of the range reported for northern California and southwest Oregon (Welsh 1990) and may indicate that they have adapted to the harsh summer thermal regime in this region.

D. Human-Social Environment

HUMAN-SOCIAL

Recreation

Dutchman Peak Lookout



The Dutchman Botanical Area provides exceptional scenic beauty within a day drive of urban communities including Ashland, Medford and Grants Pass. The Pacific Crest Trail winds along the Siskyou Crest, along the Botanical Area border. As such, this area attracts numerous visitors year-round, including collectors, hikers, bicyclists', cross country skiers, collectors, and touring vehicles. In 2004, between June and September, 517 people visited the Dutchman Peak Lookout, with an average 20 individuals per day (Erin Halcomb 2005: p.c.).

Roads

Although 440 miles of road now wind through the Little Applegate watershed (~3.0 miles per section), only 1 mile of road exists within the Dutchman Botanical Area. National Forest System Roads include #800 and #805, which intersect with Road #20 bordering the southern boundary of the Botanical Area, providing access to the Dutchman Peak Lookout. All roads are native surfaced and are considered in good condition (USDA 1995).

Grazing

The intensive sheep grazing during the 1880s through the 1920s was undoubtedly responsible for loss of topsoil (Atzet and Wheeler 1982) in the dry and wet meadows of the higher elevation landscapes, particularly the Glaciated Headwaters. Sheep were present in such numbers and were grazed in an uncontrolled fashion that their effect on vegetation, especially in high-elevation meadows, was substantial. Sheep concentrated in the headwaters of Yale and Upper Glade Creeks and along the Siskyou Crest. Forest Service grazing reports of the 1910s portray the area as being in a very poor state, with a steadily declining condition (Crater N.F. 1916 [Grazing Report]: 1-2, 1917 [Grazing Report]: 3).

Forest Service estimates for 1917 put the annual number of sheep ranging in and immediately adjacent to the upper Little Applegate watershed at over 5,000 head (Gribble 1917:3). The number of sheep declined significantly after World War One to about 1,000 head in the early 1920s. Although notorious among Forest Service grazing examiners for wandering beyond their permitted range, the sheep summered mostly along the Siskiyou Crest between Grouse Gap/McDonald Basin and Red Mountain/Jackson Gap. Overgrazing by sheep created large areas of bare, compacted soil, susceptible to rill and gully erosion during summer thunderstorms. The entire sheep range was described by Ranger John Gribble as "badly overgrazed", with feed "exceedingly poor" and some areas "totally bare" of vegetation (Crater N.F. 1916 [Grazing Report]:1-2, 1917 [Grazing Report]:3).

View looking south from Forest Service Road 20 into Silver Fork Basin, Oregon

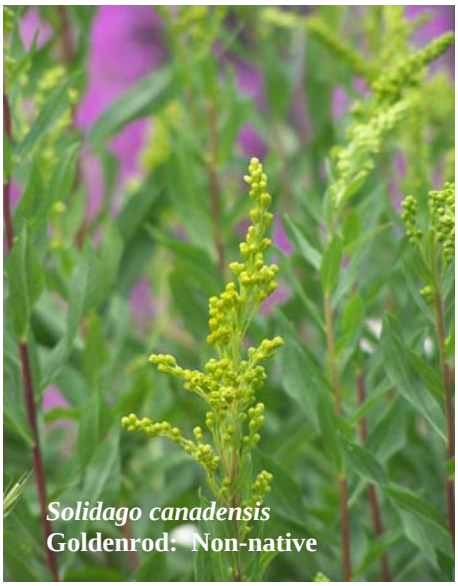
Forest Service grazing examiners indicate cattle typically migrate back and forth between the Rogue River - Siskiyou National Forest, in Oregon and the Klamath National Forest in California. Fence enclosures have been constructed in an attempt to keep animals from migrating and trampling wet meadows. However, heavy snow pack and steep slopes have resulted in damaging sections, and have consequentially since been removed (Mark Hocken 2005: pc).

IV. Key Issues and Findings

The term "issues" is used to organize the discussion; "findings" are designed to represent a statement of the historic and/or current conditions and likely trends. Statements are implied to be somewhat general, and not necessarily applicable to every acre or the entire area. The following Key Issues and Findings are associated with the Dutchman Botanical Area:

Overgrazing

Historic overgrazing by sheep caused denudation of the soil with consequent erosion, coupled by compaction of the soil resultant of trampling. The intensive sheep grazing during the 1870s and the 1920s was undoubtedly responsible for loss of topsoil (Atzet and Wheeler 1982), especially in the high elevation dry and wet meadows. The continued accelerated erosion in the granitic soils along this section of the Siskiyou Crest can be attributed in large part to the initial overgrazing by sheep. The relationship between sheep and cattle disturbance was most likely sheep created widespread soil disturbance, while cattle, up until the 1950s, hindered the range from recovery. Several of these erosion features are still active today.



Solidago canadensis
Goldenrod: Non-native

Overgrazing tends to favor perennial species over annual species, causing a shift in vegetative composition. Desirable grasses, including green fescue (a favorite feed), continued to shrink, while false hellebore and unpalatable species increased with exotic species invading disturbed soil. Forest Service herbarium collections taken from the headwaters of the Little Applegate before 1920 indicate that European weeds had invaded the high meadows by at least 1910 (Wayne Rolle 2005: p.c.).

Bryophyte communities at risk are those growing in wet areas. Every site examined in wetlands, whether springs, lake margins, or streambeds, has been severely impacted by livestock trampling. Not only were herbaceous species affected; Sambucus clumps in the streambeds were gnawed to the nub (Wagner 1995).

Impacts from grazing have been significantly reduced since 2002, with the temporary prohibition of 153 cattle in the Glade Creek Allotment to allow for Quartz Fire post-burn recovery. Open range practices continue today in the vicinity of Yale Creek and within Silver Fork Basin. Cattle migrating from adjacent range allotment in California continue to degrade soil and vegetative resources where animals concentrate.

Fire Suppression Practices

During suppression efforts to contain Quartz Fire in 2002, one extensive ridgeline dozerline was constructed in the Dutchman Botanical Area within Yale and Glade Creek sub-watersheds. Despite post-burn rehabilitation, fire-lines are still evident today (Mumblo 2005: p.c.).

Recreational Practices

The extent of collection of butterflies, moths or plants and shrubs resulted in a special closure order by the US Forest Service in August 1990, pursuant to Title 16 CFR 261.50(a) and (b), prohibiting unofficial and/or unauthorized collection activities.

Lichen communities most at risk are those of the rock outcrops on ridge tops. Hiker impacts might pose a risk to lichen, since previous workers have observed they are vulnerable to loss from abrasion during dry periods. (Wagner 1995).

Noise disturbance caused by people and motor vehicles may act to harass wildlife.

Distant view of Forest Service Road 20 from Dutchman Peak

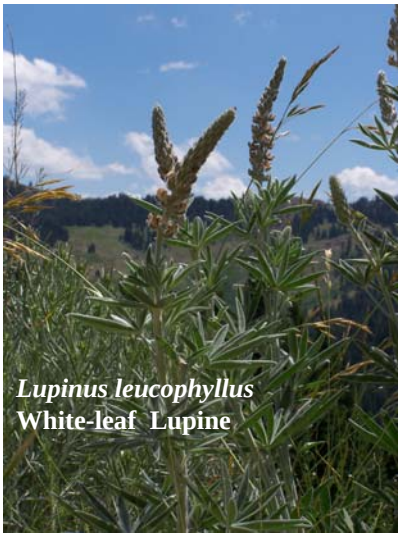
V. Recommendations and Opportunities

- Coordinate with Klamath National Forest managers to attain botanical resource objectives associated with the adjacent Special Interest Area land allocation, as defined in their LRMP.

- Further investigate area to inventory floral resource diversity, which may be located within the proposed "area of effect" of projects or elsewhere. Document results of the investigation/inventory in the project environmental analysis.

- Evaluate the floral diversity found within the area using a qualified botanist, to determine the appropriate classification. Survey and evaluate effects to floral resources on a project-specific basis before authorization.

- Assess the impacts of a proposed action to determine the effect of the project upon potentially or know significant floral resources.


Lupinus leucophyllus
White-leaf Lupine

- Mitigate potential adverse impacts to significant floral resources by redesigning a proposed action to avoid damage or disturbance, or implementing appropriate mitigation procedures to reduce the adverse impact to the resource.

- Inventory and protect floral resources to insure that values are not damaged or destroyed until they can be evaluated for scientific study, interpretation or other appropriate uses. Protection of values may include avoidance of the site, or scientific removal, analysis and reporting.

- Evaluate and enhance floral resources for scientific, educational and ethnic use to the extent the integrity of the resource is maintained. Use should be carefully monitored.

- Develop and administer schedules for long-range floral resource management.

- Range management strategies should strive to move cattle through the watershed so that cattle do not become concentrated long enough for soil cover to be lost through overgrazing or trampling, especially in wet areas.

Castilleja applegatei
Applegate's Indian Paintbrush

- Monitor the effects of grazing on soil cover. Findings from these studies should help identify what measures should be taken to restore vegetative cover and soil productivity on high elevation sites.

- Keep developments such as roads, trails, and other facilities to the minimum necessary for public enjoyment of the area.

- Build no roads or other improvements through rare or sensitive plant communities.

- Permit public use and enjoyment of the area to the level that will ensure protection of the special values for which the area was established.

- Provide interpretive services to enhance visitor's understanding and appreciation of the area's special features.

- Wildfire may be actively suppressed using low impact methods to minimize disturbance to soil and vegetative resources.

- Minimize practices that may introduce non-native species. Monitoring surveys should be conducted annually (Mumblo 2005: p.c.).

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